New laparoscopic peritoneal pull-through vaginoplasty technique

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ABSTRACT

BACKGROUND: Many reconstructive surgical procedures have been described for vaginal agenesis. Almost all of them are surgically challenging, multi-staged, time consuming or leave permanent scars on abdomen or skin retrieval sites. **AIM:** A new simple technique using laparoscopic peritoneal pull-through in creation of neo vagina has been described. **MATERIAL AND METHODS:** Total of thirty six patients with congenital absence of vagina (MRKH syndrome) were treated with laparoscopic peritoneal pull through technique of Dr. Mhatre between 2003 till 2012. The author has described 3 different techniques of peritoneal vaginoplasty. **RESULTS:** This technique has given excellent results over a period of one to seven years of follow-up. The peritoneal lining changes to stratified squamous epithelium resembling normal vagina and having acidic Ph. **CONCLUSION:** Apart from giving excellent normal vaginal function, as the ovary became accessible per vaginum three patients underwent ovum retrieval and pregnancy using surrogate mother, thus making this a fertility enhancing procedure.

KEY WORDS: Absent vagina, mayer rokitansky kustner hauser, primary amenorrhoea, vaginoplasty peritoneal

INTRODUCTION

The development from the Mullerian duct is one of the most ill understood topics in gynecology. It is really a marvel to find out how different segments of the Mullerian duct develop anatomically and functionally in to different structures, the fallopian tube as a thin supple peristaltic organ, thick distensible contractile uterus with local immunity, thick competent and distensible cervix and tremendously elastic vagina. Each part having different reproductive function. The development and differentiation of the Mullerian duct is not only important in the fetal stage but continuation of it's down growth and metaplasia in adult life explains the pathogenesis of many gynecological conditions like endometriosis and ovarian neoplasms.

The total absence of Mullerian development will lead to aplasia, while the partial development which is a common occurrence leads to tubal and partial uterine development and complete absence of upper three fourth of vagina. In most of the cases of upper vaginal absence, the uterus is usually duplicated, hypo plastic or rudimentary. The ovaries are normal but are placed on lateral pelvic wall along with the uterus. Classically this is described as "Mayer Rokitansky Kustner Hauser" (MRKH) syndrome. Probably it has autosomal recessive genetic transmission. These patients have normal secondary sexual development. The estimated prevalence is about 1:4000 to 5000 women.[1-2]

The associated congenital anomalies of the urinary tract such as pelvic kidney, horse-shoe shaped kidney or unilateral renal agenesis is found in about 30-40% of MRKH syndrome and about 10-15% may have skeletal anomalies.

There are many operative options available for the creation of neo-vagina. Free skin graft[3], Intestinal or sigmoid vaginoplasty[4,5], amnion graft[6,7] and pelvic peritoneum graft[8] have been used. The disadvantages include stenosis, poor lubrication, scarring, contracture leading to dyspareunia and the need for laparotomy was the negative factors. Transformation to squamous cell carcinoma from free skin graft and adenocarcinoma from sigmoid have been reported.[9,10]

The amnion graft can transmit hepatitis or human immunodeficiency virus, although the use of freeze-dried amnion prevents such a transmission. Recently there are reports of creation of neovagina via endoscopic assistance based on Vecchietti technique[11-13]. These procedures are complicated, time consuming and result in complications.

The use of peritoneum in vaginoplasty was first described in Russian literature. This method was popularised by Davydov.[14] He reported a series of 28 patients with good results and complete epithelisation was reported in 8 months. The peritoneal use procedure was done by open laparotomy method. The conventional surgery is currently being replaced by laparoscopy and its use in vaginoplasty was inevitable. Semm first described creation of neo-vagina using laparoscope. He used dura matter cerebri grafts.[15] His procedure was time-consuming requiring extra instrumentation and was associated with complications. The more recently reported technique describes laparoscopic application to modify original Davydov procedure. The laparoscopic modification resulted in shorter operating time and reduced postoperative morbidity.

Dr. Mhatre's modifications.

The author has described 3 different techniques of peritoneal vaginoplasty.

- Use of thin peritoneal graft
- Use of thick peritoneal graft with substratum,
- Combined use of peritoneum with amnion grafts in cases of MRKH syndrome along with pelvic kidney, where retrieval of peritoneum is difficult and associated with complications.

MATERIAL AND METHODS

Total of thirty six patients with congenital absence of vagina (MRKH syndrome) were treated with laparoscopic peritoneal pull through technique of Dr. Mhatre at the Kedar hospital (18 cases), a private obstetrics and gynaecology hospital, Mumbai and department of obstetrics and gynaecology of N. Wadia hospital (16 cases) Mumbai, and 2 cases at Railway hospital Mumbai between 2003 till 2012. The patients were followed from 9 months to maximum of seven years. The patients ranged between ages of 16 to 27 years. Interestingly three of the patients were from medical fraternity and two of them practising gynaecologist.

Apart from routine pre-operative work-up a diagnostic laparoscopy was performed to determine mobilisation and feasibility of creating anterior and posterior flaps for peritoneal pull through and to see the size and position of the utricles on lateral pelvic walls to determine the possibility of uterine implantation in the neo-vagina.

- A horizontal incision is made midway on the blind vaginal pouch between bladder and rectum. Blunt dissection is done till apex of the vaginal pouch to create an adequate vagina [Figures 1-3].
- The anterior and posterior tongue shaped flaps was created laparoscopically [Figure 4] In case of loose peritoneum thin flaps are created especially from anterior peritoneum. In 6 cases (out of 36) thick peritoneal flaps along with substratum were obtained [Figures 5 and 6]. Care must be exercised to achieve haemostasis in cases of thick peritoneal grafts. Haemostasis may be achieved with use of bipolar cautery or use of harmonics.
- Modification of the peritoneal flaps may be done depending on the availability of free peritoneum. In number of cases posteriorly the rectum is close apposition and for fear of rectal damage it is advisable not to take
- Posterior peritoneal graft. In such an event both the flaps may be designed from anterolateral pelvic peritoneum.
- In case of presence of pelvic kidney or double ureter (3 cases Author) fashioning of peritoneal grafts may be difficult and may be combined with freeze dried or fresh amnion grafts [Figures 7 and 8].
- Dividing the thick vesico-rectal band in the mid line facilitates the mobility of posterior peritoneum. This modification recently has helped the author in acquiring posterior flap immensely.
- The top of the neo-vaginal space is made prominent by a sponge on holder and is divided using sharp scissors or bipolar cautery [Figures 9 and 10].
- The peritoneal flaps are drawn through this opening and pulled from below so as to reach the introitus. They are attached using 3-0 vicryl-interrupted sutures [Figure 11].
- The top of the neo-vagina is closed using 2-0 prolene purse-string suture to isolate from rest of the general peritoneal cavity [Figure 12].
- The peritoneal flaps are kept in continuation with the parent site through the attachment thus ensuring continuation of blood supply.
- In select cases the utricles were implanted either as single or after unification to the neo-vagina as a separate 2nd stage procedure.
- In patients who underwent peritoneal pull-through surgery vaginal mould was not required. The peritoneal lining prevents vaginal shrinkage and adhesions.
- During follow-up the neo-vaginal space can be dilated gradually to maintain the desired length till sexual activity is resumed. Dilatation using glass dilator increases the length and diameter of neo-vagina and also change the axis to one which ideal for intercourse. The neo-vagina is in correct anatomical axis. The pelvic peritoneum lining the neo-vagina is responsive to oestrogen.

Average operative time, days of hospitalization and any intra-operative and postoperative complications were noted. Long-term follow-up of these patients were done to note the vaginal depth and sexual satisfaction.

Figure 1: Infiltration of saline

Figure 2: Dissection and creation of neovagina

Figure 3: Neovagina with Sims speculum

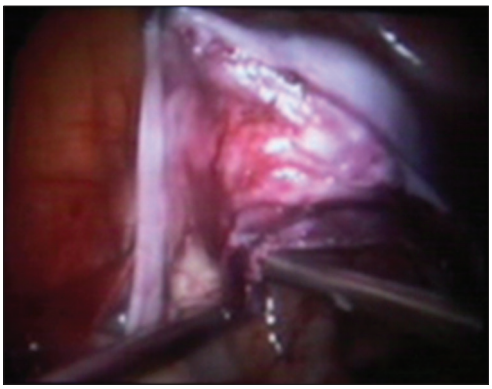

Figure 4: Creation of peritoneal flaps

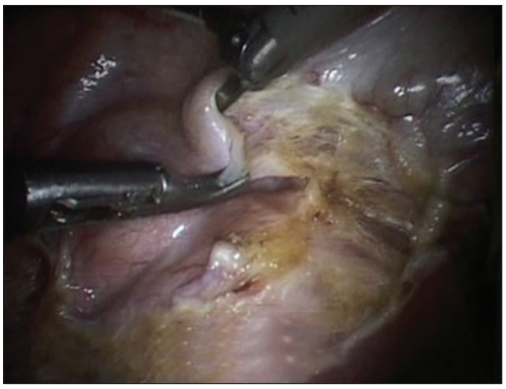

Figure 5: Thick peritoneal flap anterior

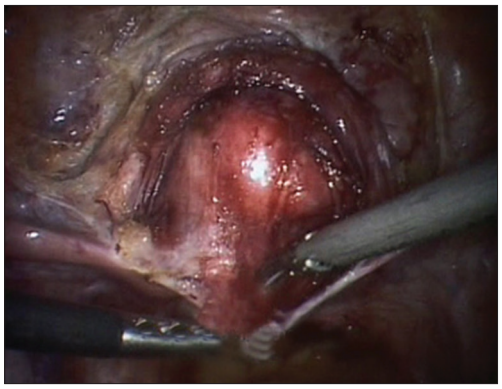

Figure 6: Thick peritoneal flap anterior and posterior

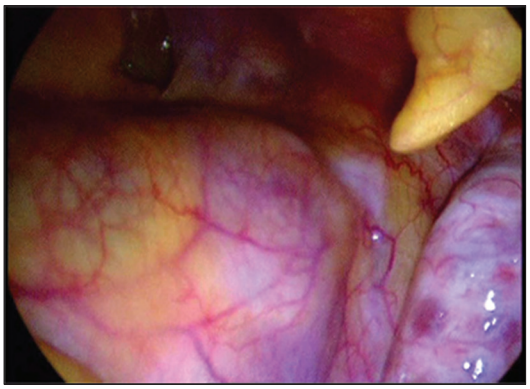

Figure 7: Pelvic kidney

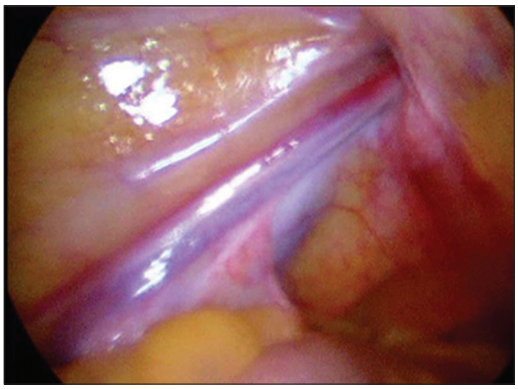

Figure 8: Double ureter

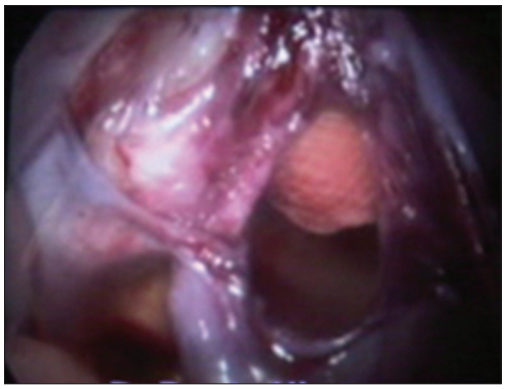

Figure 9: Neo-vagina opened from above

Figure 10: Neo-Vagina opened from above

Figure 11: Peritoneal flaps sutured to introitus

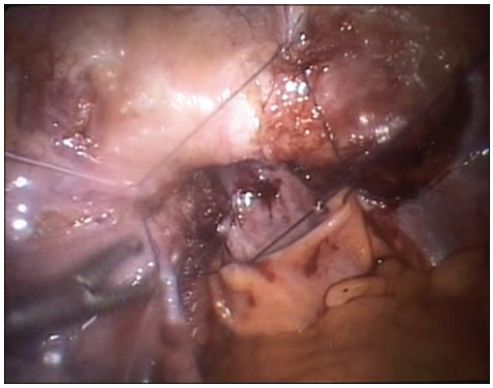

Figure 12: Closure of the vault

The clinical summary

The clinical summary of patients treated with laparoscopic peritoneal pull through vaginoplasty. The outcome was noted in all 36 patients

- Average operative time was 1-1.5 hrs
- Average stay was 3 days, except 2 cases required stay of 5 days.
- Intraoperative or postoperative complications: There were no major complications reported, except one patient had small rectal damage which was managed with suturing the rent and had uneventful recovery and one patient had voiding difficulty requiring three days of catheterization.
- Vaginal depth on follow up: all the patients had adequate comfortably vaginal length of about 7 to 8 cm, admitting full size Sim"s speculum.
- 7 years follow up 3 patients
- 6 years follow up 3 patients
- 5 years follow up 9 patients
- 4 years follow up 4 patients
- 3 years follow up 5 patients
- 2 years follow up 6 patients
- 9 months to 1yr 6 patients
- Sexual satisfaction on follow up: Out of 36 patients, 9 were married and 15 patients married after the vaginoplasty. All 24 patients reported no difficulty to either partner
- Almost all the patients had apprehension to begin which required good counselling.
- The unmarried girls required two days of supervised teaching for the use of glass dilator, while the married patients were more comfortable in doing so.
- More than 90% of the patients were positively happy having a successful vaginoplasty, with no obvious signs of surgery.
- They were asked to follow up every week, for four weeks to insure the correct use of glass dilator.
- Vaginal lubrication was required for 3 months. Natural lubrication occurred after 6 months.
- Nine patients were subjected to neo vaginal biopsy after 6 to 12 months of surgery, [Figures 13 and 14] and showed normal stratified vaginal lining. All 36 patients had vaginal cytology done after 6 months showing normal vaginal pattern.
- As the ovary became accessible per vaginum three patients underwent ovum retrieval and pregnancy using surrogate mother, thus making this a fertility enhancing procedure.

Statistical analysis

- Age: 72% of patients belonged to the age group 18 to 22, while the youngest was 16 and the oldest 27 years of age.
- Marital status: 25% of patients were already married, while 41.5% married immediately post-surgery.

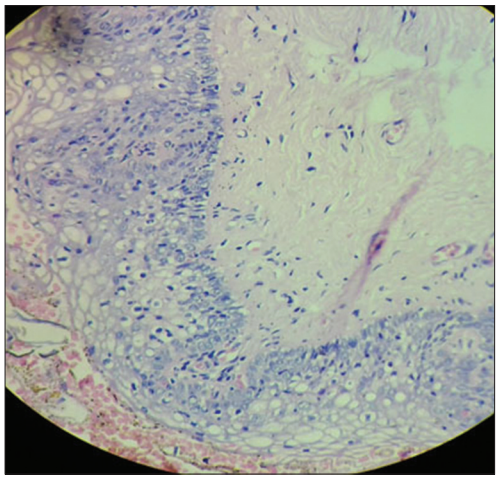

Figure 13: Vaginal epithelium 12 months postoperative low power

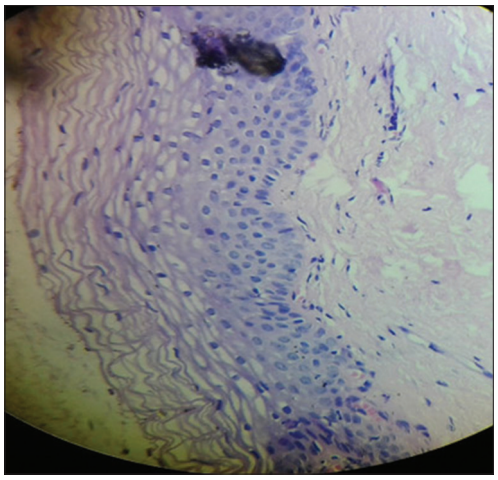

Figure 14: Vaginal epithelium 12 months posterative high power

- The design of this study was retrospective. Calculations of statistically significant differences between groups of patients or between the healthy female control groups were not made.
- Almost 90% of patients required supervised glass dilatation in the first postsurgical week.
- 100% of women required vaginal lubrication for first 3 months.
- The need for lubrication declined drastically after 6 to 9 months in the married group of patients (66.5%)
- 50% of patients complained of pain and discomfort in the early period. The pain free intercourse was usually performed after 3 to 6 months.
- The patients were asked regarding the optimal timing of surgery. 72% of patients desired the operation should have been performed earlier. Most of the cases the social stigma attached with absent vagina, and general belief of correlation with transgender subject was the reason cited. The successful vaginoplasty reassured the patients and their family dramatically.

The following vaginoplasty techniques were used previously are compared

Techniques	Number
Conventional split thickness skin grafts	09
Fresh amnion grafts	09
Freeze dried amnion grafts	16

Pre-operative vaginal length:	The preoperative length between 0.5 to 1 cm
Operative time:	The average time was one to one and half hours.
Hospitalization:	The average time of hospital stay was 7 -10 days
Complications:	There were no major complications reported.

In the patients other than peritoneal pull through technique:
Vaginal depth on follow up: all the patients had adequate vaginal length immediate postoperative period, but progressively underwent fibrosis and reduction of the vaginal length by 30 to 50% over a period of one year.

Sexual satisfaction on follow up: Majority of patients reported progressive difficulty to both partner and shortening of vaginal length. Vaginal dryness was a major problem necessitating use of lubrication

CONCLUSION

In conclusion the new laparoscopic peritoneal pull-through vaginoplasty offers a relatively easy surgical procedure with excellent results on long term follow up. This procedure is practically devoid of morbidity associated with other techniques. Peritoneal lining having the same parentage of mullerian duct undergoes metaplasia and transforms itself in to stratified squamous epithelium resembling normal vagina. This transformation has been documented in nine patients. As the ovary became accessible per vaginum three patients underwent ovum retrieval and pregnancy using surrogate mother, thus making this a fertility enhancing procedure.

REFERENCES

1. Capero V, Gallego M. Vaginal agenesis. Am J Obstet Gynecol 1976;124:96-107.
2. Chervenak F, Stangel J. Mayer-Rokitansky-Kustner-Hauser syndrome. N Y State J Med 1982;82:23-7.
3. Wesley JR, Coron AG, Michigan AA. Intestinal vaginoplasty for congenital absence of vagina. J Pediatr Surg 1992;27:885-9.
4. Wiser WL, Bates GW. Management of agenesis of vagina. Surg Gynecol Obstet 1984;159:108-12.
5. Radhakrishnan JK. Colon interposition vaginoplasty a modification of Wagner-Baldwin technique. J Pediatr Surg 1987;22:1175-6.
6. Ashworth MF, Morton KE, Dewhurst J, Lilford RJ, Bates RG. Vaginoplasty using amnion. Obstel Gynecol 1986;67:443-6.
7. Rothman D. The use of peritoneum on construction of vagina. Obstel Gynecol 1972;40:835-9.
8. Soong YK, Chang PH, Lai YM, Lee CL, Chou HH. Results of modified laparoscopically assisted neovaginoplasty. Human Reprod 1996;11:200-3.
9. Hopkins MP, Morley GW. Squamous cell carcinoma of the neovagina. Obstet Gynecol 1987;69:525-7.
10. Baltzer J, Zander J. Primary squamous cell carcinoma of the neovagina.

Gynecol Oncol 1989;35:99-103.
11. Vecchietti G. Construction of a functional vagina: A new approach to the RKH syndrome. Clin Exp Obstet Gynecol 1974;2:3-8.
12. Gauwerky JF, Wallweiner D, Bastert G. An endoscopically assisted technique of construction of a neovagina. Arch Gynecol Obstet 1992;252:59-63.
13. Popp LW, Ghiradini G. Creation of neovagina by pelviscope. J Laparoendosc Surg 1992;2:165-73.
14. Davydov SN. Obstel Gynecol (Moscow) 1969;12:55.
15. Semm K. Pelviscopiche Kontrolle der neovaginaen operationstechnik ubcer eine gliederoptik. Alete wissenschaftlicher dienst 1983;93:24-7.

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